

# **Project Instructions for the NOAA Ship RONALD H. BROWN**

## **Puerto Rico Trench Exploration Cruise II**

**Cruise Number:** RB-03-03

**Cruise Dates:** February 18, 2003 through March 7, 2003

**Operating Area:** Puerto Rico Trench

**Sea days:** 18

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Captain Craig N. McLean, NOAA  
Director, NOAA Office of Ocean Exploration

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RADM Nicholas A. Prahl, NOAA  
Director, Marine Operations Center

## **I. Cruise Overview**

### **A. Summary of Objectives:**

The principal objective of the Puerto Rico Trench Exploration Cruise II of the NOAA Ship RONALD H. BROWN is to complete the bathymetric survey of the walls and floor of the Puerto Rico trench, the deepest part in the Atlantic Ocean, using the SeaBeam 2112 multibeam bathymetric system of the NOAA Ship RONALD H. BROWN. These data will be merged with multibeam data acquired in 2002 aboard the RONALD H. BROWN to produce the first coherent high-resolution bathymetric map of the Puerto Rico trench. The map will be used as a base map for further explorations of potential hydrothermal seeps and biological communities in this unique environment and for research into the processes that form and maintain the Puerto Rico trench.

We chose mapping as a first step in exploration of the Puerto Rico trench system because characterization of the sea floor and water column provides a framework for future exploration. We appreciate and want to make the most of the opportunity granted us by the NOAA Office of Ocean Exploration to work with the NOAA Ship RONALD H. BROWN to perform this exploration.

### **B. Operating Area:**

The western edge of the Puerto Rico trench region comprising the walls and floor of the Puerto Rico trench between water depths of 2500 m and 8200 m and coordinates latitudes 18°54'N-20°24'N and longitudes 62°00'W and 68°54'W. See attached map.

### **C. Participating Institutions:**

U.S. Geological Survey (USGS), Woods Hole Field Center.  
Center for Coastal and Ocean Mapping, University of New Hampshire (CCOM/UNH).

### **D. Personnel:**

Uri ten Brink, Chief Scientist, U.S. Geological Survey, Woods Hole Field Center  
William Danforth, U.S. Geological Survey, Woods Hole Field Center  
Charles Worley, U.S. Geological Survey, Woods Hole Field Center  
Jane Denny, U.S. Geological Survey, Woods Hole Field Center  
2 Teachers to be determined  
Student to be determined, University of New Hampshire  
Student to be determined, University of Puerto Rico  
Observer to be determined, Dominican Republic  
Observer to be determined, United Kingdom  
2 Marine Mammal Observers to be determined  
1 NOAA Office of Coast Survey crew member to be determined  
2 NOAA OE staff to be determined

**E. Administrative:**

- 1) POC: Dr. Uri ten Brink, Chief Scientist, U.S. Geological Survey, Woods Hole Field Center, Woods Hole, MA 02543. Tel: 508-457-2396; Fax: 508-457-2310. E-mail: [utenbrink@usgs.gov](mailto:utenbrink@usgs.gov).
- 2) Required clearances: Dominican Republic and Great Britain. Clearance request was submitted to Wanda Campbell on October 30, 2002. Clearance to be determined.  
RONALD H. BROWN Field Operations Officer LT, Michael Hoshlyk contacted the US Navy to determine whether cruise dates coincide with scheduled US Navy operations in the proposed survey area. This is also to be determined.
- 3) Logistics: A functioning new Hippy board, or other motion sensor system, is requested prior to departure date for this cruise. The current Hippy board associated with the SeaBeam system on the RONALD H. BROWN does not function properly. The RONALD H. BROWN, prior to NOAA OE cruises RB-02-07 and RB-02-08, determined this malfunction, however, despite attempts at replacing unit, the system never operated properly.

**II. Operations**

**A. Data to be collected:**

Three types of data will be acquired, as follows:

- 1) SeaBeam 2112 multibeam bathymetry: analog (paper) and digital records (RONALD H. BROWN system).
- 2) Backscatter data using the SeaBeam 2112 multibeam system in conjunction with the bathymetry (RONALD H. BROWN system).
- 3) 1-2 CTD and XBT profiles of sound speed as a function of depth to calibrate sound propagation for the SeaBeam system.

**B. Staging Plan:**

- 1) Science gear comprises portable computers to be provided by science party.
- 2) Science party requests to meet ship in San Juan, PR in a.m. of February 21, 2003 (or on date of arrival of RONALD H. BROWN in Puerto Rico), and will load portable computers at that time. ETA of RONALD H. BROWN in Puerto Rico after transit from Miami, FL beginning on February 18, 2003 is approximately three days, which brings the arrival date to February 21, 2003. Exact time of arrival of RONALD H. BROWN in Puerto Rico is to be determined by CO of RONALD H. BROWN.

**C. Cruise Plan:**

- 1) Cast a CTD at the start of the survey to obtain a sound profile with depth.
- 2) Acquire SeaBeam multibeam data along specified track lines at ship's speed to be adjusted for performance and coverage under sea conditions in the operation area (c. 10 knots).

- 3) Specific NOAA OE request: Acquire SeaBeam multibeam data during transits between Miami and the designated survey area in the Puerto Rico trench.
- 4) Cast additional CTDs and XBTs as needed.

D. Waypoints:

Lines will be run from east to west and back at 6 minute (11 km) line spacing to ensure complete bathymetric coverage. The western part of the trench will be covered first followed by the eastern part of the trench. Waypoints will be provided by the Chief Scientist when clearance is determined for Great Britain and Dominican Republic EEZ waters, and when it is determined whether cruise dates coincide with scheduled US Navy operations in the proposed survey area.

E. Station Operations:

CTD at 18°54'N 66°00'W. Additional CTDs as needed.

F. Underway Operations:

- 1) SeaBeam 2112 multibeam bathymetric survey: analog (paper) and digital records (RONALD H. BROWN system).
- 2) Backscatter data using the SeaBeam 2112 multibeam system in conjunction with the bathymetry (RONALD H. BROWN system).
- 3) Acquire SeaBeam multibeam data during transits between Miami and the designated survey area in the Puerto Rico trench.

G. Applicable Restrictions: None.

H. Small Boat Operations: None.

I. De-staging Plan: Offload science team and gear preferably in San Juan, PR on March 7, 2003. ETA to be determined.

### **III. Facilities and Responsibilities**

A. Equipment and Capabilities Provided by Ship (itemized):

- 1) SeaBeam 2112 multibeam system with analog and digital recorders and recording media, all in optimal working order: Survey technician required to operate and maintain system; members of scientific party will stand watches to oversee acquisition of data.
- 2) CTD system. Survey technician required to operate and maintain CTD winch and CTD control panel during hydrocasts.
- 3) Access to the Internet for a member of the scientific party to post a mission log for use by the education community (daily).
- 4) Access to satellite telephone to support interviews and interactions between members of the scientific party and shore.

B. Equipment and Capabilities Provided by Scientists (itemized):

Computers (4) for on board processing of the SeaBeam data by members of the USGS and CCOM/UNH groups. Watches to be determined by Chief Scientist.

**IV. Disposition of Data and Reports**

A. Data Responsibilities:

SeaBeam processing by USGS and CCOM/UNH groups; cruise report completed by scientific party and submitted to NOAA OE (see Appendix D); submission of data to NOAA OE/NGDC as mandated.

B. Pre-and Post-cruise Meetings: As needed.

C. Ship Operation Evaluation Report: As mandated.

**V. Additional Projects**

A. Supplementary (“Piggyback”) Projects: None anticipated.

B. NOAA Fleet Ancillary Projects: None anticipated.

**VI. Hazardous Materials:**

A. Policy/compliance: None.

B. Inventory: None.

C. MSDS: None.

**VII. Radioactive Isotopes**

A. Policy/compliance: No radioactive isotopes anticipated.

B. Inventory: Not applicable.

C. License and Name of Person Holding License: Not applicable.

**VIII. Miscellaneous**

A. Scientific Berthing: 15 scientific berths needed. Berthing plan, including gender of science crew will be provided by Chief Scientist.

B. Medical Forms and Emergency Contacts:

Members of scientific party will be instructed by Chief Scientist to complete the NHSQ form and submit it to ship; emergency contacts to be provided. RONALD H. BROWN Medical Officer LCDR Dan Aronson, has been contacted for information on submission of this information.

C. Shipboard Safety: Compliance with ship protocol.

D. Communications: As specified in Section III.

E. Port Agent Services/billing: Not applicable.

F. Wage Marine Working Hours and Rest Periods: Compliance with ship protocol.

**IX. Appendices**

A. Equipment Inventory: Not applicable.

B. Hazmat Inventory: Not applicable.

C. Charts/figures, etc.: See attached map of survey area.

D. Cruise Report: See outline for recommended content

## **APPENDIX D: Cruise Report Content**

The Principal Investigator is requested to provide the NOAA Office of Ocean exploration with a cruise report within 90 days of the completion of the project. The following is a list of required content regardless of the format chosen:

- Project title
- Expedition dates
- Vessel identification
- Geographic area of operation
- Project goals and objectives
- Anticipated benefits
- Brief description of methodology (inc. equipment used)
- Summary of operations – table containing:
  - Operation ID or code
  - Operation type
  - Operation description
  - Date
  - Start time, end time
  - Start coordinates, end coordinates
  - Unique observations
  - Comments
- Milestones achieved (miles surveyed, etc.)
- Summary of education and outreach activities
- Participants (name, contact info., role during cruise)
- Inventory of data files collected (date, file name, file type, physical storage location)
- Post-cruise activities

Note: The NOAA Office of Ocean Exploration is currently in the process of developing metadata guidelines and standards for all ocean exploration missions. For this cruise, it is requested that all geospatially referenced data is documented using the Content Standard for Digital Geospatial Metadata (CSDGM) developed by the Federal Geographic Data Committee (FGDC).